The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Mental Health

Mortality Report
2000

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INTRODUCTION

Research has repeatedly documented that people with serious mental illness are at increased risk of dying prematurely in a range from 1.6 to 2.8 times greater than the general population (1-10, 26). Countries as varied as Canada, Denmark, Germany, Israel, Norway, Spain, Taiwan and the United Kingdom have each individually documented this disturbing finding. And, although predictably, psychiatric patients have been found to be at particular risk from suicide, they also are at increased risk of dying from accidental injuries and from medical conditions such as cardiovascular, infectious and respiratory illnesses.

The relationship between mental disorders and physiologic changes is not clearly understood. Some studies have suggested that mental disorders or accompanying stress may lead to physiologic changes that then alter endocrine and immunologic function, thereby resulting in decreased resistance (11). People with serious mental illness also are more likely to live in poverty, to smoke, to have concurrent medical illness and never to have married. A number of studies from various countries have shown that lack of emotional support and social networks can increase the risk of death from medical conditions, such as myocardial infarction, as much as eight-fold, even after adjusting for factors such as smoking (12-16). Lower socioeconomic status also has been shown to be associated with a higher death rate, even adjusting for factors such as smoking (17-18). Finally, tobacco use contributes significantly to years of life lost, and people with serious mental illness are more likely to smoke than the general population (19-20). This may be related to the antidepressant and antipsychotic effect of nicotine, which has been suggested in several studies.

People with serious mental illness in the United States have similarly been shown to be at increased risk for premature death from accidents, infectious, cardiovascular and circulatory illnesses and suicide (21-25). Therefore, it is incumbent upon the Commonwealth of Massachusetts to examine this possible trend among its own citizens with serious mental illness in order to develop appropriate plans to address health and wellness issues in this high risk population.

OVERVIEW

A primary mission of the Department of Mental Health (DMH) is to serve people with serious mental illness. However DMH does not serve all Massachusetts citizens with psychiatric disorders, but only those who meet certain eligibility requirements. To be eligible, in addition to having a qualifying major mental disorder, individuals also must have significant functional impairments, such that they cannot meet many of their basic needs for a substantial period of time. Thus, the DMH population is not representative of most people with psychiatric diagnoses, nor even of all those who have ever had an acute psychiatric hospitalization, as it is made up entirely of the most severely disabled individuals. For this reason, the results of this mortality report cannot be generalized to all persons who have ever had a diagnosis of any mental disorder.

In 2000, DMH served 30,660 people (adults, children and adolescents). In the same year, 168 DMH clients died from a variety of causes. The age-adjusted death rate of DMH clients was 538.1 persons per 100,000 population in 2000, as compared to an age-adjusted rate of 577.9 in 1999.

TABLE ONE
DMH Mortality Compared to Massachusetts

Category	**2000**	**1999**
DMH Deaths	168	164
DMH Population	30,660	32,289
DMH Crude Death Rate	479.6 per 100,000 population	507.9 per 100,000 population
MASS Crude Death Rate	891.3 per 100,000 population	877.5 per 100,000 population
DMH Age-Adjusted Mortality*	538.1 per 100,000 population	577.9 per 100,000 population
MASS Age-Adjusted Mortality*	816.5 per 100,000 population	815.92 per 100,000 population

* Note: The age-adjusted rate is the summary rate that is used so that any differences in rates cannot be attributed to different age distributions among populations or across years.

As can be seen from TABLE ONE, in 2000 both the crude death rate and the age-adjusted death rate among DMH clients decreased relative to the 1999 rates, even as the 2000 crude rate and age adjusted rate increased in Massachusetts as a whole. For DMH clients, the largest number of deaths occurred in the 35 to 64 year age group, in marked contrast to Massachusetts as a whole, where the largest number of deaths occurred among individuals age 85 and older. This is largely because the DMH population is comprised mostly of 15 to 64 year-olds and includes very few individuals over 85, as compared to the rest of the Commonwealth.

Examination of the age-specific death rates reveals a higher than expected death rate among certain age groups in DMH as compared to Massachusetts as a whole. This excess risk of death among 15 to 64 year-old DMH clients also was seen in 1998 and in 1999, as can be seen in TABLE TWO.

TABLE TWO
Age-Specific Death Rates, per 100,000 Population

Age Group	**DMH 2000**	**DMH 1999**	**DMH 1998**	**MASS 2000**	**MASS 1999**	**MASS 1998**
15-24	63.5	135.5	68.3	49.1	46.0	47.2
25-44	463.2	394.7	388.8	119.4	118.4	116.3
45-64	901.5	892.5	809.4	552.3	565.4	587.2

The death rate among DMH clients between ages 15 and 64 is substantially higher than the age-specific death rates for the same age groups in Massachusetts. These individuals

with mental illness from 15 to 64 years of age, in all three years, have a death rate that is 1.3 to 3.9 times higher than the general population. While the most pronounced difference is in the 25 to 44 year old group, a substantial increase in premature death also can be seen in the 45 to 64 year old and 15 to 24 year old age groups.

It should be noted that the DMH population and number of deaths are quite small as compared to the population and the number of deaths in Massachusetts as a whole. With such small numbers there can be marked variation in rates from year to year even though the actual number of deaths is quite small. As an example, in 2000, the 15-24 year olds in DMH had three deaths total. If there had been only one more death in the 15-24 year old age group, the DMH rate would have increased from 63.5 per 100,000 to 84.7, making an even starker contrast with the Massachusetts population. However, when such small numbers are involved, this kind of variation may be by chance alone, and not represent any real difference between the two groups.

LEADING CAUSES OF DEATH

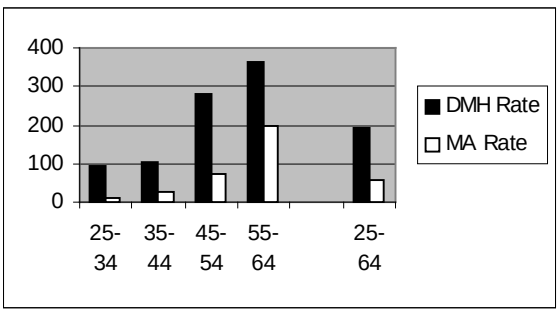
For 2000, the leading causes of death for DMH clients were: cardiac disease (31% of all deaths); injuries, including accidents and suicide (21.4%); cancer (16.1%); pulmonary disease, including both chronic obstructive pulmonary disease and pneumonia/influenza (6.0%). By comparison, the leading causes of death for all Massachusetts were 27.1% heart disease; 24.7% cancer; 8.8% pulmonary; and 6.4% stroke. What is remarkable, however, is that the DMH population has many younger individuals than in Massachusetts as a whole. Given the younger age distribution of the DMH population and the fact that death from cardiac disease, obstructive pulmonary disease and pneumonia/influenza is more typical of older people, it is remarkable that the proportion of deaths from cardiac and pulmonary causes is so similar to the Commonwealth as a whole.

Natural Causes:

In 2000, natural causes accounted for 78.6% of all DMH client deaths, which is lower than in the general Massachusetts population where natural causes account for 95.8% of all deaths. As in 1998 and 1999, DMH clients have an unexpectedly high rate of death among 25 to 64 years olds from heart disease, respiratory disease, pneumonia and influenza and diabetes.

As can be seen in FIGURE 1, in 2000, the rate of death from heart disease among DMH clients in every age group between 25 and 64 exceeds that in the general population. This is the third year in which this trend has been apparent.

FIGURE 1: Age-specific rates of heart disease, DMH and Massachusetts, 2000



Overall, the risk of dying from cardiac disease is 3.3 times higher for DMH clients age 25 to 64 as compared to Massachusetts residents in this same age group. This appears to be an increase from previous years. In 1998 and 1999, the chances of a 25 to 64 year-old DMH client dying of heart disease was 2.0 to 2.5 times higher than among similarly aged residents of Massachusetts. The same information can be seen in tabular form in TABLE THREE:

TABLE THREE
Age-Specific Death Rates, per 100,000; DMH Compared to Massachusetts

Age	DMH Deaths	DMH Population	DMH Death Rate, Cardiac	MASS Death Rate, Cardiac	Relative Risk, DMH vs. MASS
25-34	4	4,178	95.7	8.3	11.5
35-44	8	7,696	104.0	23.7	4.4
45-54	18	6,452	279.0	71.9	3.9
55-64	12	3,309	362.7	196.0	1.9
Total 25-64	**42**	**21,635**	**194.1**	**59.5**	**3.3**

The risk of dying in 2000 from pulmonary conditions also is higher for 25 to 64 year-old DMH clients than it is for similarly aged individuals in the general population. The chances of dying from chronic lower respiratory disease is 2.2 times higher and the rate from pneumonia and influenza is three times higher for DMH than for the general population. The relatively few deaths in 25 to 64 year-old DMH clients from these conditions (four from chronic lower respiratory disease and two from pneumonia and influenza) makes age-specific rate calculations impossible for 2000.

While it may be that these rates have considerable variability, given these small numbers, the same elevated risk of dying from these conditions also was noted in 1998 and 1999. In all three years, individuals with chronic mental illness in DMH care were many times more likely to die of these conditions than the general Massachusetts population, as can be seen in TABLE FOUR.

TABLE FOUR
Relative Risk of Dying from Pulmonary Conditions 1998-2000
DMH Compared to Massachusetts

Year	Lower Respiratory	Pneumonia Influenza
1998	4.1	5
1999	6.3	4
2000	2.2	3

In 2000, the risk of dying from diabetes among 25 to 64 year-old DMH clients was 2.2 times as high than among other Massachusetts residents. It also was elevated in 1998 and

1999. The risk of dying from cirrhosis and liver failure was 1.6 times as high, also similar to 1998 when it was 2.3 times as likely and 1999, when it was 1.5 times as likely. Again, the small number of these deaths (four from diabetes and three from cirrhosis) makes it possible that this occurred by chance alone, but the elevated trend over several years suggests that continued vigilance over future years is warranted. TABLE FIVE illustrates the likelihood that individuals with chronic mental illness will die from a particular condition as compared to the general Massachusetts population.

TABLE FIVE
Relative Risk, Diabetes and Cirrhosis/Liver Failure

Year	Relative Risk of Death from Diabetes; DMH vs. MASS	Relative Risk of Death from Cirrhosis/Liver Failure; DMH vs. MASS
1998	1.2	2.3
1999	2.5	1.5
2000	2.2	1.6

Injuries:

Among DMH clients, injuries of all types account for 21.4 % of all deaths, as compared to Massachusetts as a whole, where injuries account for only 4.2% of all deaths. This is largely because of the suicide rate among DMH clients.

In 2000 there were 18 suicides, essentially the same as in 1998 (16) and 1999 (15). The overall rate for suicide in DMH was 58.7 per 100,000 in 2000, essentially the same as in 1998 (57.7) and 1999 (46.4). It is, however, considerably higher than the rate of 6.2 per 100,000 in the general population of Massachusetts. Suicide accounts for 10.7% of all DMH deaths in 2000 and represents 4.5% of all suicides in Massachusetts even though the DMH population accounts for only 0.48% of the total population. It is not surprising that there are a disproportionate number of suicides in the DMH population, since chronic suicidality is a major reason why many individuals are in DMH care.

There were no homicides among DMH clients in 2000.

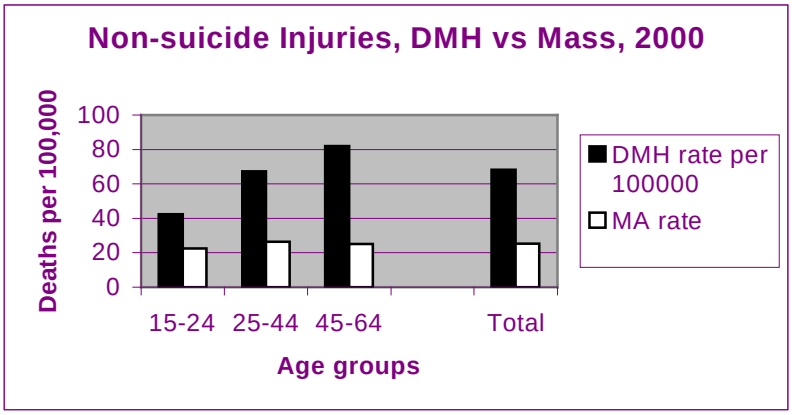
Deaths from other types of injuries also were higher among DMH clients, including deaths from motor vehicle accidents, non-transport accidents and injuries of undetermined intent. All of these injuries among DMH clients were in the 15 to 64 year-old age groups. The rate of such injuries was approximately twice as great as in the same age groups for Massachusetts. Death from all these other types of injuries was at the same rate as deaths from suicide and accounted for 10.7% of all DMH deaths.

Two-thirds of these injuries are categorized as “Injuries of Undetermined Intent.”

Generally this category is used to describe instances in which it is difficult to ascertain whether the death was because of an intentional self-inflicted injury or an unintended accident. Eleven of the 12 deaths from Injuries of Undetermined Intent were due to poisoning by drugs. Nine were from narcotic or hallucinogen overdose, presumably in substance abusing individuals who obtained these drugs illegally. Two were from overdoses of psychotropic drugs, either inadvertently or purposefully.

Overall, the high rate of injury deaths among DMH clients can be attributed primarily to suicide, but there also are high rates of poisonings, either purposeful or inadvertent, by illegally obtained drugs. Deaths from motor vehicle accidents and other accidents also may be higher than in the general population, but in this case, the numbers are so small it is difficult to be certain of the significance of this observation.

TABLE SIX
Deaths from Unintentional Non-transport Injuries, Motor Vehicle Accidents and Injuries of Undetermined Intent



PLAN OF ACTION

DMH has prioritized this important area of concern with the following plan of action:

Consumer Education:

Many of the causes of premature death have roots in lifestyle choices. For this reason, DMH has partnered with the Consumer Council of the National Alliance for the Mentally Ill (NAMI) to generate a curriculum and videotape that will be used as part of a campaign to promote risk reduction for this population. The curriculum, "Hearts and Minds: Promoting your Health, Reducing your Risk," will contain a videotape featuring individuals with serious psychiatric illnesses who have altered or improved their lifestyle choices that impact these causes of premature death. It will focus on positive strategies people have incorporated into their day-to-day lives. The curriculum also will contain written materials and offer resources for people seeking other information to promote preventive health. This effort, under the direction of Ken Duckworth, M.D., Deputy Commissioner for Clinical and Professional Services, will be distributed nationally by

NAMI in its hundreds of consumer support meetings. In Massachusetts, local partners from family and consumer groups are consulting on this project.

Shaping Clinical Culture Toward Preventive Care:

While consumer choices are important to reducing these risks, there is an important role for all providers in the individual's life to support preventive care. DMH has promoted the concept of identifying these medical risks and their prevention throughout its system and sponsored two one-day forums on Preventive Care Strategies for its 10th Annual Adult Services Conference in September 2002 as well as numerous local forums statewide. For example, in Central Massachusetts, more than 400 practitioners attended a very successful conference on this topic. The development of Clinical Practice Guidelines for practitioners are in process and will summarize best practice approaches to the medical conditions identified in this report. Don Goff, M.D., Associate Professor of Psychiatry at Harvard Medical School, is a partner and co-chair with DMH on this report.

Improving the Quality of Information:

The DMH Mental Health Information System (MHIS) is in its pilot phase for producing an electronic medical record for clients. MHIS, which will be used in our state-operated facilities, will gather clinical information relevant to these risks and enable better treatment planning to prevent some of the medical problems that ensue. The Department of Public Health (DPH) has been working with us to improve the quality of client information.

To better understand the risk factors leading to early death from natural causes, DMH collaborates with the Division of Medical Assistance (DMA), regarding the sharing of interagency data. This project examines the diagnoses, pharmacy records and utilization of care of deceased DMH/DMA clients from 1998 to 2000 compared to the DMH/DMA population who did not suffer early death. This study should help delineate the role of specific psychopharmacologic agents or of potentially adverse drug interactions in contributing to mortality among individuals with chronic mental illness.

Polypharmacy:

While the role of polypharmacy (use of multiple medications) or adverse drug interactions has yet to be clearly defined, DMH continues to be alert to the possibility that the medications that are used to treat chronic mental illness may have adverse side effects. One study in England has connected polypharmacy and early death. Medical staff from the DMH Division of Clinical and Professional Services represents DMH at the Massachusetts Coalition for the Prevention of Medical Errors, which has been active in reducing medication errors and potentially adverse outcomes from polypharmacy. DMH also is active in the strategy for demanding better clinical thinking before polypharmacy is employed with Medicaid patients.

Infectious Disease Management:

DMH medical staff participates on the statewide advisory board that focuses on Hepatitis C. Interagency projects have been undertaken with DPH and have demonstrated an elevated prevalence of Hepatitis C among DMH clients, which may contribute to the elevated death rate from cirrhosis and liver failure. With DPH support, DMH is developing a protocol for client education and for treatment of Hepatitis C among DMH clients. Also with DPH support, DMH is developing an adult immunization initiative to address hepatitis, influenza and pneumonia, which should ameliorate the increased risk of death from these conditions.

Improving Access to Medical Services:

DMH also is working with DMA to improve the provision of medical care to those DMH clients who have been reluctant to access office care from primary care providers. Currently three DMH sites have primary care providers working on-site to provide an integrated model of care. While this initiative is still in its pilot stages, the presence of medical providers at the DMH sites appears to have some benefit on client education and support with regard to reducing cardiovascular risk factors.

Understanding Risks and Protective Factors Related to Suicide within the DMH Client Population:

DMH actively works to serve people with suicidal ideation, and thus has a population at high risk for completed suicide. DMH is evaluating 104 suicides within DMH between 1996 and 2000. A preliminary report of these suicides focuses on the elements of the individual and the care system that correlate with the completed suicide. Further research in this area will be necessary in order to inform our clinical system of ways in which the incidence of suicide may be reduced.

SUMMARY

Overall, individuals with serious mental illness who receive services from DMH do not have a higher crude death rate or age-adjusted death rate than the population of the entire state. The age-specific death rate for individuals between the ages of 15 and 64 is, however, 1.2 to 4.8 times higher for DMH clients than for the general Massachusetts population.

The leading causes of death for DMH clients and for the Commonwealth's citizens are, for the most part, similar, with heart disease, cancer, injuries, pulmonary disease and pneumonia/influenza among the top six causes of death in both populations. However, heart disease, pulmonary disease and suicide account for a greater proportion of all deaths among DMH clients than in Massachusetts as a whole, while cancer and stroke account for a lower percentage of all deaths in DMH than for the population at large.

One of the most striking findings has been that the age-specific mortality for certain conditions for 25-64 year-olds is elevated for DMH clients for the third consecutive year. In 2000, the risk of dying from cardiac disease was 3.3 times higher for 25-64 year-olds than for the general population. For other conditions, the small number of deaths makes rate calculation somewhat unstable, yet the same trends are noted over the three-year period. The chances of dying from chronic obstructive pulmonary disease, pneumonia/influenza and diabetes are two to three times more problematic as a cause of death for DMH clients in the 25 to 64 year age group, than for similar age individuals in the general population.

Given that the DMH mission is to serve individuals with serious and persistent mental illness, it is understandable that DMH clients have a higher prevalence of suicidal ideation and a higher suicide rate than the general population. In 2000, DMH clients also have a higher rate of death from non-suicide accidents, especially overdoses from narcotic and hallucinogenic agents, highlighting the profound impact substance abuse has in a group of individuals with chronic mental illness.